

# **APPENDIX I**

LOCKING DEVICE FOR THE LID OF A STORAGE COMPARTMENT OF A  
MOTOR VEHICLE

BACKGROUND AND SUMMARY OF THE INVENTION

[0001] The present invention relates to a locking device for a cover of a glove compartment of a motor vehicle.

[0002] German document DE 36 16 020 A1 shows such a locking mechanism for a cover of a glove compartment in a motor vehicle. The cover can be opened by a swivel movement and is held in the closed position by two sliding locks projecting on two opposite narrow sides of the cover. To open the lock, the two sliding locks are synchronously pulled out of the lock openings of the frame in opposite slide motions by means of an actuation element located in the cover.

[0003] It is an object of the invention to create a locking device for a cover of a glove compartment which requires the smallest possible installation space, especially in the area of the cover.

[0004] This object is achieved by a locking device according to the invention. The actuation device is thereby disposed on the frame side and, in order to disengage the

lock by means of engagement on the detent section of the associated lock, pushes the lock out of the rear section of the locking contour on the frame. Since the coupling kinematics require little installation space, the other locking bar is carried along in its own opening direction by the locking bar being pressed in the direction of opening and engaging the actuation element, whereupon it also moves out of the locking contour on the frame. The coupling kinematics can, for example, contain a rocker arm, advancing bevels, or push / pressure rods. The bars can be constructed as slide locks or swivel-locking bars. The engagement locations of both locking bars on the frame are as far from each other and the swivel axis of the cover as possible. They can, for example, be positioned at two opposite ends of the narrow side of the cover facing away from the swivel axis of the cover.

[0005] According to certain features of the locking device, the locking bars are spring-loaded in the direction of their detent advancement so that the bars can be independently moved into their locked positions. The engagement of the actuation device disposed on the frame side can be purely of a pressing nature; a separate locking actuation can be omitted.

[0006] Both locking bars of the cover can be configured as sliding locks. Sliding locks and their associated slide receptacles offer the possibility of being able to be locked, with a simple design, free of play in a functionally secure manner. In addition,

the construction of the area of the slide lock body disposed inside the cover as a push rod facilitates the kinematic coupling of the two locking positions, which are located far from each other, without using any other component parts.

**[0007]** The locking device may include a mechanical coupling of the opening movement of the other locking bar via a gear. The coupling of the opening movement of the other locking bar to the opening movement of the locking bar associated with the actuation element can also occur, for example, hydraulically, pneumatically, or electrically. The mechanical gear thereby offers an especially cost effective, simple to produce, and functionally secure possibility for coupling.

**[0008]** In order to achieve an especially good support of the cover by way of the locking bars, they are disposed on the opposite narrow sides of the cover, specifically in the end area of the narrow side facing away from the swivel axis of the cover. Each of the two locking bars disposed there includes a detent advancement oriented in opposite directions, which advancement can be coupled via push rods in an especially simple and space-saving manner.

**[0009]** In another embodiment of the locking device, coupling of the movements of the locking bars that is free of play and smooth while at the same time requiring little installation space is achieved by having locking bars at their end areas facing

each other include toothed rack sections, with a mutual overlapping area, with which a geared wheel that is disposed on the housing side meshes and reverses the direction of movement.

[0010] The locking device may have actuation elements including a push button and a disengaging element moved by the button in a direction transversely to its advancement direction. In this process, the disengaging element acts in a pressing manner on the detent section of the associated locking bar, whereupon the bar can be shifted to its release position. The disengaging element can be spring-loaded against the actuation direction, so that a particularly functionally secure and free-of-play actuation of the locking release is achieved as a result of the pre-tensioning of the push button and the disengaging element.

[0011] In order to achieve an opening movement of the cover during an opening of the actuation element, the cover is spring-loaded in the opening rotational direction.

[0012] A blocking means which holds the locking bar of the cover in position upon assumption of the open position may be provided. To accomplish this, for example, a spring-loaded detent pawl positioned on the cover housing side engages behind a catch flange on one of the locking bars. By holding the locking bar in its release position retracted in the cover, an especially advantageous appearance is created when the

cover is opened. When folding in the cover, the blocking means is not to be closed by striking the frame, but instead is automatically brought to the release position during the closing movement of the cover, for example, by the striking of a tracer pin on the frame. This results an especially low resistance and comfortable closing of the cover.

[0013] The locking device, the cover, and the frame may form wall sections on the cover circumference side, which are aligned transversely to the swivel axis of the cover, substantially parallel to each and opposite each other. Pass-through openings are provided on the cover side for the two locking bars, and locking recesses are provided in the frame opposite the pass-through openings on the frame side. By omitting separate component parts or elevations to form a frame-side blocking contour, an especially compact shape and an especially inconspicuous appearance are created.

[0014] Other advantageous embodiments, features, and advantages of the locking device are apparent from the drawing and its description.

#### BRIEF DESCRIPTION OF THE DRAWING FIGURE

[0015] Figure 1 is a cutaway depiction of a glove compartment with a cover.

**DETAILED DESCRIPTION OF THE INVENTION**

[0016] Figure 1 shows a cutaway depiction of a glove compartment of a motor vehicle with a closed cover cut horizontally in the assembled position. The illustration is limited to the assembled location of the cover of the glove compartment and the adjacent means for opening actuation. The cover 2 of the glove box 1 is positioned basically in an inclined, protruding manner on the side of the instrument panel of a vehicle facing the passenger. The cover 2 comprises a swivel axis positioned horizontally in the assembled position. The housing 1.1 of the glove compartment 1 encloses the glove box volume in a box-shaped manner. On the side facing the passenger, the housing 1.1 forms a frame 3 for receiving the cover 2. The glove compartment box 1 is housed in an installation space behind the car interior lining 7, in this case the instrument panel of the motor vehicle. The cover 2 closing the glove compartment 1 in the frame 3 is fitted to the surface outline of the car interior lining 7. The cover 2 comprises a cover rear part 2.1 facing the housing 1.1 of the glove compartment 1, as well as a cover front part 2.2 facing the passenger, which is provided with a decorative covering 2.3. Two locking bars 4 and 5 are disposed in a hollow space formed between the cover rear part 2.1 and the cover front part 2.2.

[0017] The locking bars are configured as sliding locks, each having an elongated shape and serving as a push rod. The locking bars 4 and 5 are held in the cover 2 by

means of slide guides and, when the cover is closed, engage in the pass-through openings in the cover rear part 2.1, which openings function as slide guides.

[0018] The pass-through openings of the locking bar in the cover rear part 2.1 are disposed on two opposite narrow sides of the cover 2. Wall sections of the frame 3 exhibit lock openings 3.1 and 3.2 disposed opposite to these pass-through openings, the respective edges of which are positioned in the opening direction of the cover and function as locking contours for the locking bars 4 and 5. When the cover 2 is closed, the wall sections are positioned opposite to these two narrow sides of the cover and are aligned parallel to them. The end areas of the locking bars 4 and 5 protruding through the pass-through openings of the cover 2 form locking sections 4.1 and 5.1 of the locking bars, which engage in the locking contour of the frame. The locking sections 4.1 and 5.1 exhibit stop chamfers on the sides positioned forward in the closing direction of the cover 2, by means of which chamfers the locking bars can engage in the cover when coming in contact with the edge of the frame in the cover. The locking bars 4 and 5 exhibit, in their end areas facing away from the locking sections 4.1 and 5.2, a common overlapping area with toothed rack sections 4.2 and 5.2 facing each other. A gear wheel 8 positioned in the cover rear part 2.1 is located between the toothed rack sections 4.2 and 5.2 and meshes with the two toothed rack sections 4.2 and 5.2. The gear comprising the toothed rack sections 4.2 and 5.2 and the gear wheel 8 effects a coupling of the pushing movements of the locking bars 4 and 5 in opposite movement directions,

so that as a result, when the locking bar 4 is moved in its direction of opening, the locking bar 5 moves in its opening direction.

[0019] The locking bar 4 is spring-loaded by a return spring 4.3 in the detent advancement direction and is secured by a stop to prevent it from sliding through the pass-through opening. The locking bar 4 and the locking bar 5 coupled thereto via the toothed rack sections 4.2 and 5.2 and the gear wheel 8 are moved independently via the spring loading into the locked position.

[0020] An actuation element 6 is positioned on the frame 3 of the housing 1.1 in the assembled position laterally next to the cover 2 of the glove compartment 1 at the height of the locking bar. The actuation element 6 exhibits a push button 6.1 and a disengaging element 6.2. The push button 6.1 is guided substantially perpendicularly to the surface of the car interior lining 7. The push button 6.1 exhibits a drive chamfer, by means of which the disengaging element 6.2 is driven, which is guided displacably transversely to the push button's 6.1 direction of push. The drive chamfer of the push button 6.1 effects a displacing movement of the disengaging element 6.2 aimed in the direction of the associated locking bar 4. When the disengaging element 6.2 engages on the locking section 4.1 of the locking bar 4, the locking bar 4 is pushed out of the locking contour on the lock opening 3.1 on the frame 3 of the housing 1.1, in order to release the locking device. The movements of the locking bars 4 and 5 coupled via the

toothed rack sections 4.2 and 5.2 and the gear wheel 8 cause the locking bar 5 to be moved out of the locking contour of the lock opening 3.2 positioned opposite thereof. As a result, the cover 2 in the frame 3 of the glove compartment 1 is released and can swing, for example under its own weight combined with spring force, into the open position. The disengaging element 6.2 is spring-loaded against the actuation direction, whereupon the disengaging element 6.2 and the push button 6.1 automatically move back to their original position after release.

[0021] Located in the cover rear part 2.1 is a detent pawl 9 which, as soon as locking bar 5 assumes its open position and the cover swings open, automatically engages due to spring-loading behind a catch flange 5.2 on the locking bar 5 and, as a result, holds the locking bar 5 and the locking bar 4 coupled in its movement in the open positions. As a result, the locking sections 4.1 and 5.2 of locking bars 4 and 5 remain hidden in the cover housing when the cover is opened. When closing the cover, the locking sections 4.1 and 5.1 of the locking bars therefore need to be pressed in across their chamfers, resulting in a very comfortable operation for closing the cover while eliminating the associated force application. When the cover 2 is completely closed via a tracer pin 10, which is pushed across a stop in the cover 2 positioned on the frame side, the detent pawl 9 is automatically brought to the release position and allows the locking bars 4 and 5 to move into their locked position via their spring-loading by the spring 4.3 acting in the detent advancement direction. In the process, a

separate tracer pin 10 is especially secure in its function and has an advantageously simple appearance. A variety of other actuation devices for the detent pawl 9 controlled by the cover position are also conceivable. For example, a flange constructed as one piece on the detent pawl 9 may be provided. In addition, the cover rear part 2.1 can have a catch protrusion that can be brought in engagement with the locking bar in its open position. It is elastic, so that it can, for example, be brought to the release position by placing the cover on the frame.